





The beginnings of a dream... to feed the world!

## Sunflower Shrimp Mission

Raise locally grown, freshly harvested hormone and antibiotic free Pacific White Saltwater Shrimp with a tiny environmental footprint

How do we grow saltwater shrimp indoors in Kansas?



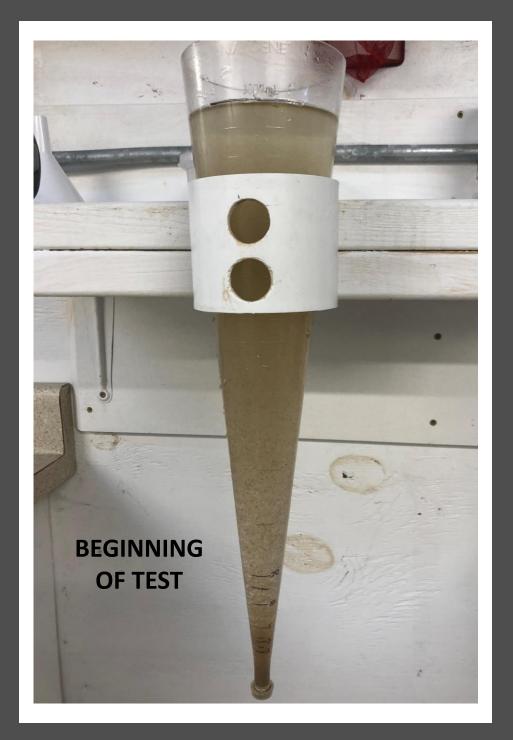
# RAS – Recirculating Aquaculture System

### A ZERO WATER DISCHARGE SYSTEM

Utilizing the same water for continuous production cycles, preserving salinity levels and biofloc

## What is BIOFLOC?

Biofloc is a biological filtering system composed of many species of organisms, including plant and animal components such bacteria, protozoa, and algae









## The energy demands of Sunflower Shrimp



Location	Devices	Watts	hrs/day	Watt-hr/Day	Watt-hr/Yr
Total	66	21,422	12	141,802	51,793,272
mechanical	8	6,152	18	122,755	44,836,337
lab	11	10,038	15	8,301	3,031,984
production	26	2,174	14	3,652	1,333,747
bathroom	4	1,469	6	992	362,419
outside	2	44	17	620	226,309
selling	9	201	13	3,286	1,200,387
office	5	264	13	2,196	802,089
nursery	1	1,080	0	0	0
		0			
		0			
Activities and Offsite		2,674			3,994,525
NurseryXchange	1	36	0	0	8,241
poolround	2	2,014	0	0	50,350
offsite	3	624	19	3,592	3,935,934
Total Watts		24,096		141,802	55,787,796
KW		24	0	141.80	55,788

April 23, 2018

#### USDA REAP Grant April 2018 Application Review Team:

Enclosed please find the grant application for Sunflower Shrimp LLC located in Oxford, Kansas. Below is a summary of the methodology used to calculate the annual energy use for the business, Sunflower Shrimp LLC, and the annual percentage of energy to be replaced by the proposed solar system.

Summary of Energy Usage and Proposed Solar Generation for Sunflower Shrimp LLC

Description	Value	Units	Variable/ Calculation
Annual energy usage for 360 South Oxford Road, Oxford, Kanas (home + business): Note 1	55,698	kWh/year	A
Percentage of energy associated with business: Note 2	95.7%	%	В
Annual business energy usage:	53,302	kWh/year	A * B = C
Annual amount of renewable energy to be generated by proposed system:	44,163	kWh/year	D
Annual percentage of energy to be replaced:	83%	%	D / C * 100 = E

Note 1: Annual energy usage determined by SRI Wind Solar, using electrical utility bills received from Sunflower Shrimp LLC. This value includes the total energy usage for the residence and the business (Sunflower Shrimp LLC), which is located in a detached barn on the property.

Note 2: Percentage of energy associated with business determined through an inventory of all electricity-consuming equipment used by Sunflower Shrimp LLC (inventory completed by Sunflower Shrimp LLC and verified by Kansas State University Engineering Extension). This inventory includes blowers, hydronic pumps, boilers, heaters, lights, fans, and various other pieces of equipment required to operate and maintain temperature and humidity for nine 3,000 gallon tanks. In the Report Supplement tab, EEX has provided a copy of the Excel spreadsheet used to calculate the energy consumption as part of this grant application, as well as Sunflower Shrimp energy data.

Should you have any questions, please do not hesitate to contact myself or Yvonne Cook (evie@ksu.edu).

Sincerely,

David A. Carter

K-State Engineering Extension – Kansas Energy Program

dcarter@ksu.edu; 785-532-4998

2018 For Second Date First Date **Enter Dates** 12/31/2018 1/1/2018 eg.1/1/2007 Monday Day of Week Monday 7:43:00 AM 7:43:00 AM Sunrise 5:21:00 PM 5:22:00 PM Sunset 9:39 9:38 Hours of Daylight **Elapsed Days** 365.00 Hours of Daylight from first to second date 4449.97 Hours of Night from first to second date 4310.03 8760.00

## The energy supply for Sunflower Shrimp Production



# Installing the Solar System



**July 2018** 



#### Project Financial Summary

Utility Saving Over Initial Term	\$219,259.58	USD
Payback Period	4.87	Years
Total Life-Cycle payback	469.0 %	
Levelized Cost of Solar Energy	\$0.03	/ KWH (over system life)
Rate of Return on Cash Invested	19.5 %	
Average Monthly Bill Savings	\$730.87	(over system life)

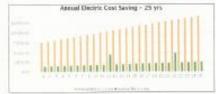
"Contract Price/Project Cost" in Project Cost Summary table shows the proposed total contract amount due and payable by you, the customer. SRI Wind Solar will handle rebutes application if rebates are available. Actual rebute or incentives amount may vary, based on availability at time of application submittals.

Solar PV system output and estimated savings are calculated based on several factors including product type, system production, geography, weather, shade, electricity use, full utilization of the 30% solar investment tax credit, and utility rate structures and rate increases.

#### Energy / Electricity Analysis

We use your historical energy usage data to analyze and size proposed solar system. Based on the system size suggested, the first-year electricity bill saving projection is provided together with a chart of the monthly solar system output (PV production). In addition, the expected electricity bill saving over next 25 year period are provided as well.



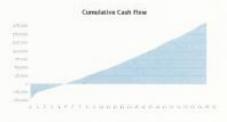


#### Benefits of Solar

Significantly reduce annual electric bills Protect from rising electric rates Attractive cash flow Attractive return on investment Reduce CO2, NOX and SOX gas emissions Increase property value Enjoy Fed / State tax saving Enjoy new technology



#### Saving / Cash Flow / Payback Analysis



#### Quick Summary

PAYBACK PERIOD: 4.87 YEARS

1ST YEAR % OF BILL OFFSET: 83.0 %

25YRS BILL SAVING: \$219,259,58

Year	0	1	2	3	4	5	. 6	7	
Annual Bill w/o solar		\$7,554	\$7,831	\$8,107	58,384	\$8,661	\$8,937	\$9,214	59,490
Annual Bill w solar		\$1,279	\$1,328	\$1,378	\$1,427	51,477	\$1,527	\$1,578	\$1,635
Incentive & Deprociatein Summary		\$14,031	50	\$0	50	90	50	50	50
Energy Bill Saving		\$6,276	56,503	\$6,730	\$6,957	57,183	57,410	\$7,636	\$7,863
Annual Cash Flow	(546,771)	520,307	86,503	\$6,730	\$6,957	\$7,183	\$7,410	\$7,636	\$7,860
Cumulative Cosh Flow	(546,771)	(326,464)	1519,9623	(\$13,232)	(56,375)	\$908	58,318	\$15,954	\$23,810

Year	y	10	11	12	13	14	15	16	17
Annual Bill w/o solar	\$9,767	\$10,043	510,320	\$14,596	510,873	\$11,150	511,476	\$11,703	\$11,979
Annual Bill w solar	\$1,679	\$1,729	\$4,468	\$1,832	\$1,883	\$1,934	\$1,986	\$2,038	\$2,090
Incentive & Depreciatoin Summary	50	\$0	50	50	50	50	50	50	50
Energy Bill Saving	\$8,088	\$8,314	\$5,851	51,765	\$8,990	\$9,215	39,440	39,665	\$9,88
Annual Cash Flow	\$8,068	\$8,314	\$5,851	\$8,765	58,998	\$9,215	\$9,440	\$9,005	59,589
Cumulative Cash Flow	\$31,964	\$40,218	\$46,069	554,834	563,824	\$73,039	\$82,479	392,144	\$102,033

Year	38	19	20	21	52	25	24	- 25	Total
Annual Bill wie solur	\$12,256	\$12,532	\$12,809	513,085	\$13,362	\$13,639	\$13,915	514,192	5271,824
Annual Bill washer	\$2,142	32,195	\$2,247	\$4,988	52,353	\$2,406	\$2,459	\$2,513	552,568
Incestive & Depreciatais Summary	50	50	50	50	50	50	50	50	\$14,630
Energy Bill Saving	\$10,114	\$10,338	\$10,562	58,897	\$11,009	\$11,232	\$11,456	511,679	\$219,266
Annual Cash Flow	\$10,114	\$10,338	\$10,562	\$8,897	\$11,009	\$11,232	\$11,456	\$11,679	
Consulative Cash Flow	\$112,147	\$122,494	3331,046	\$141,144	\$152,151	\$163,585	\$174,901	\$186,520	

Payback period refers to the period of time required for the benefits of your solar system to repay the sum of your original investment. Above table of cash flow and payback analysis includes tax effects (if applicable), rate and cost inflation and other time-related cash flow factors.

We recommend you, solar system buyer, to consult with local tax professional to verify and confirm any tax effects. This is only a preliminary estimate and may be altered due to changes in system design of financial assumptions. SRI Wind Solar, solar system seller, will not take responsibility for any future changes in tax law or other incentives.



#### Proposal Prepared for Smart Solar Owner

E-mail: sterling@sriwindsolar.com

Customer / Buyer:

Seller: SRI Wind Solar Sales Consultant:

Deb Daniels 360 S Oxford Rd, Oxford, KS 67119, SRJ Wind Solar SterlingCondit 3116 N 8th St, Arkansas City, KS, Phone: 316-204-3604

USA

United States

Phone: 316-293-6961 E-mail: Phone: 316-204-3604 License: BUS2005-06416 / TBC

daniels@sunflowershrimp.com

License: BUS2005-06416 / IBC Class B General

#### **Proposed System Layout and Description**

SRI Wind Solar proposes to design, permit and install a complete turn-key solar PV system at below site address.

All necessary electrical and structural engineering calculations, permit drawings package, materials and installation labor are included. SRI Wind Solar will provide 2-year installation workmanship warranty.

Site Address:

360 S Oxford Rd, Oxford, KS 67119,

USA

Project Type: System Size: Residential, Roof Mount 26.9 KW-STC (24.2 KW-PTC)

Panel Manufacturer:

China Sunergy (Nanjing)

Panel Model: Panel Qty: CSUN320-72P 84 pcs

Inverter Manufacturer:

NO. 10 P.

Inverter Model:

Ningbo Ginlong Technologies Solis-1P7.6K-4G-US

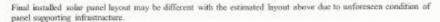
Inverter Qty:

3 pcs

Racking Manufacturer: Dual Rack

Est System Output:

44,162.55KWH (first year)



#### **Project Cost and Financial Analysis**

#### Project Cost Summary

Contract Price / Project Cost	346,771.20	(51.74/Watt-5TC
	A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

Less Fed. Tax Credit \$14,031.36

Less State Tax Credit \$0.00

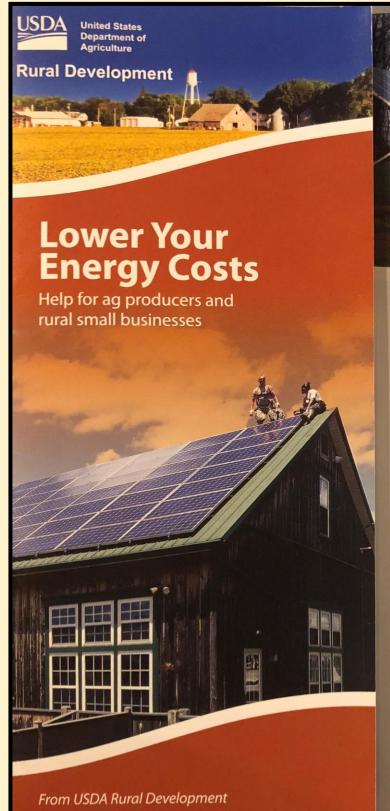
Net Price (year of installation) \$32,739.84

Less other incentives (Year 1-10) \$0,00

Net Price (all years) \$32,739.84

(\$1.22/Watt-STC)

(\$1.22/Watt-STC)





#### Rural Energy for America Program (REAP)

REAP provides assistance to agricultural producers and rural small businesses for renewable energy systems and energy efficiency improvements through Federal loan guarantees and grants. Funds may be used to purchase, install, and construct:

Renewable energy systems, including:

- Wind;
- · Solar;

- Biomass, including anaerobic digesters;
- · Geothermal; and more.

Energy efficiency projects, including:

- Heating, ventilation, and air conditioning systems;
- Insulation;
- · Lighting;
- Cooling or refrigeration units;
- Controls and equipment;
- Doors, windows, and other building improvements; and more.

Grants can finance up to 25 percent of the project cost, and loans or loan and grant combinations can finance up to 75 percent of the project cost.

Deadlines:
Oct 31, 2018
April 1, 2019
For \$20K or less

Unrestricted grants:
April 1, 2019

Ag producers with 50%+ of their gross income from ag operations and in eligible rural areas

Contact your Kansas Rural Development office for more information



## PLACING THE BRACKETS AND ADDING THE RAILS





CARRYING
THE PANELS
OVER THE
ROOF TO
INSTALL ON
THE RAILS











Working late to beat the heat!







PANELS ALL INSTALLED, AND WIRING HAS BEEN RUN TO INVERTERS









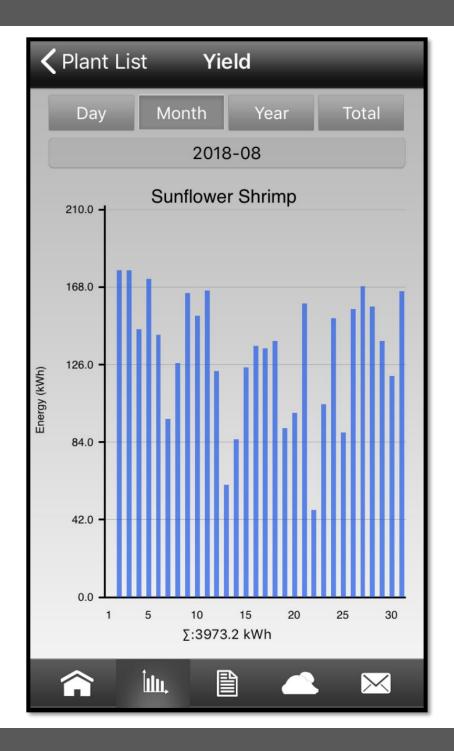


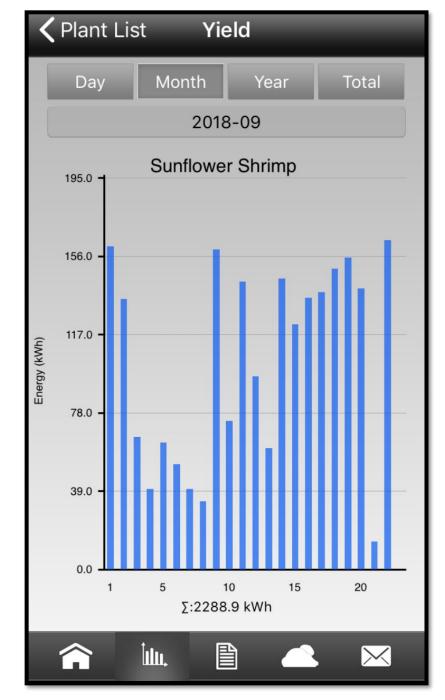






3 GREEN LIGHTS, NEW
TRANSFORMER AND NET
METER RUNNING
BACKWARDS!!







WIFI SIGNAL BOOSTER, VERIZON MIFI INTERNET HOTSPOT AND TIMER FOR CONSTANT CHARGE



All the employees are proud to be helping the environment with a tiny footprint!



## **Necessary considerations:**

- 1.) Permitting local, state and energy grid requirements
- 2.) Bank loans/collateral
- 3.) Insurance coverage for panels
- 4.) Licensed, bonded and insured installers
- 4.) Property tax impact
- 5.) Heaps of paperwork and deadlines
- 6.) Internet/wi-fi capabilities for system monitoring

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Dwelling, Replacement				180,600	1,00					
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Shrimp Barn, Replaces				155,000	1,00					
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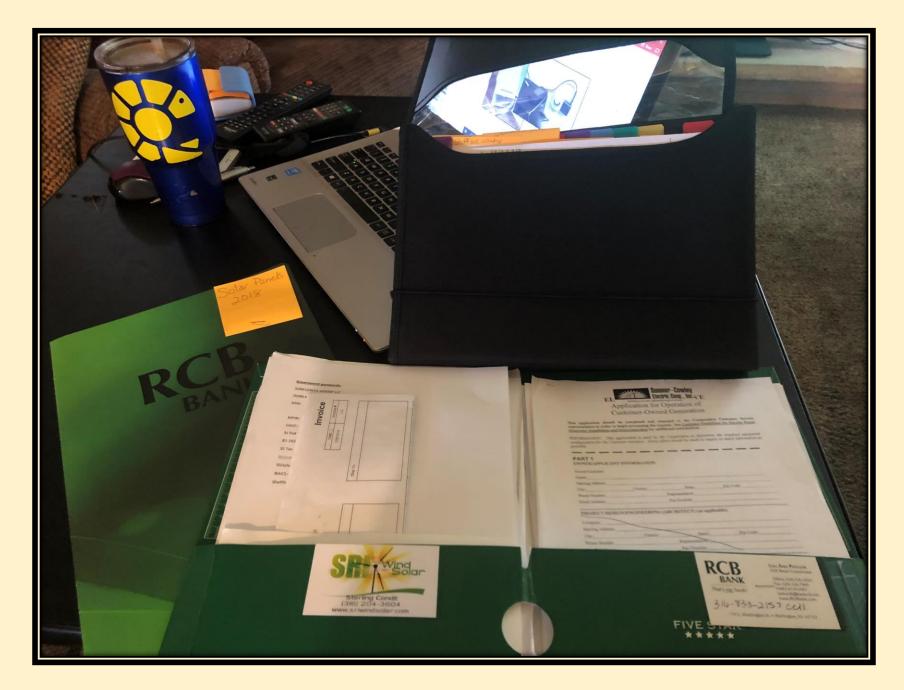
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is a must if you have a loan, and not all insurance companies will insure solar panels!

Copeland
Insurance or other
independent
insurance
companies can find
you the best
options



PASSWORDS, PAPERWORK AND FILES....OH MY!!

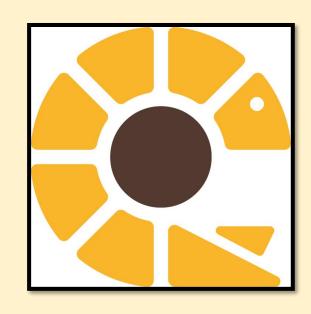


Overhead Shot of Sunflower Shrimp heading toward the future!

# SOMEWHERE OVER THE RAINBOW









# AND THE SKIES ARE NOT CLOUDED ALL DAY



# Electrical Characteristics at Standard Test Conditions (STC)

Lice	CSUN 320-72P	CSUN 315-72P	CSUN 310-72P	CSUN 305-72P	CSUN 300-72P
Module Type	The state of the s	315	310	305	300
Maximum Power - Pmpp (W)	320		0~3%	0~396	0-3%
Positive Power Tolerance	0~3%	0~3%	The state of the s	44.7	44.5
Open Circuit Voltage - Voc (V)	45.0	44.9	44.8		8.91
Short Circuit Current - Isc (A)	9.17	9.11	9.03	8.97	35.8
Maximum Power Voltage - Vmpp (V)	36.2	36.1	36.0	35.9	
Maximum Power Current - Impp (A)	8.84	8.73	8.61	8.50	8.37
	16.52%	16.27%	16.01%	15,75%	15.49%
Module Efficiency	10.3270			The Control to serve	utance with IECA1215, IECA173G-1/

module 21 received by the conditions (STQ): Irradiance 1900W /m<sup>3</sup>; AM 1.5; cell temperature 25°C measuring uncertainty of power is within 23%. Certified in accordance with IEC61215, IEC61730-4/2

# **Electrical Characteristics at Nominal Operating Cell Temperature (NOCT)**

Module Type	CSUN 320-72P	CSUN 315-72P	CSUN 310-72P	CSUN 305-72P	CSUN 300-72P
Maximum Power - Pmpp (W)	235	232	228	225	220
Maximum Power Voltage - Vmpp (V)	34.1	33.8	33.5	33.2	32.9
Maximum Power Current - Impp (A)	6.89	6.86	6.80	6.77	6.71
Open Circuit Voltage - Voc (V)	41.6	41.5	41.4	41.3	41.1
Short Circuit Current - Isc (A)	740	7.34	7.30	7.24	7.19

1 m/s : cell temperature 45°C; ambient temperature 20°C measuring uncertainty of power is within ±3%.

# **Temperature Characteristics**

Voltage Temperature Coefficient	-0.292%/K	
Current Temperature Coefficient	+0.045%/K	
Power Temperature Coefficient	-0.408%/K	

### **Maximum Ratings**

Maximum System Voltage (V)	1000	
Series Fuse Rating (A)	20	
Reverse Current Overload (A)	27	

# **Mechanical Characteristics**

Dimensions	1956 × 990 × 50 mm
Weight	22.3 kg
Frame	Anodized aluminum profile
Front glass	Toughened low Iron glass, 3.2 mm
Cell Encapsulation	EVA (Ethylene-Vinyl-Acetate)
Back Sheet	Composite film
Cells	6x12 polycrstalline solar cells (4BB or 5BB 156 X156mm)
Junction Box	Rated current ≥ 12A, IP ≥ 65, TUV & UL
Cable	Length 900 mm, 1 × 4 mm <sup>2</sup>
Connector	MC 4/ compatible with MC 4

# **Packaging**

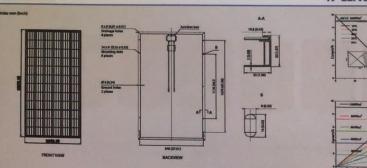
Container 20'	252 pcs.		
Container 40'	504 pcs.		
Container 40'HC	552 pcs.		

# System Design

Temp. Range	-40°C to +85°C
Hail	Max. diameter of 25mm with 23m/s impact speed
Max. Capacity	Snow 5400 Pa, wind 2400 Pa
Application Class	A
The second second	

## Dimensions

## **IV-Curves**





















The Dream Begins!











# **Interior Construction Phase**















The shrimp arrive from Indiana-let production operations begin!























**Local Marketing** 







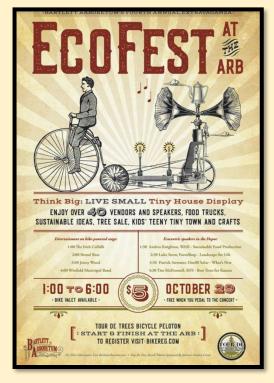




# **Consumer Education**

















All the hard work pays off! Yummy Results!





























# Recognition and Outreach





# Sunflowershrimp.com



# Facebook – Sunflower Shrimp LLC







# **More VIP visitors!**



Here is the link for the radio interview we did with Guy Bower on The Good Life radio show on KNSS.

http://media.knssradio.com/the-good-life.htm.

Choose the November 5th show and start with segment 1-3. We were honored to welcome Guy to Sunflower Shrimp and hope you enjoy the interview! Thanks again Guy Bower!



### The Good Life

Guy's conversation with Bob & Deb Daniels of Sunflower Shrimp centers around the environmental & chemical challenges of farming shrimp.

MEDIA.KNSSRADIO.COM



### Who is Cooking: Chef Eric Gephart

Chef Eric Gephart is the Director of Cultrary Impiration for Kamado Joe Ceranic Cirills. Working in restaurants while attending college, Chef Eric Geologica and interest and a possion for cooking. After graduating from UND Wilnington with a degree in literature, Chef Eric pursued bis cultivary passions, graduating from the Cultrary Institute of America in New York, Peop Logs. New York Peop Logs. New Yor



Chef Eric has sperit time in distinguished kitchens from New Yink City to New Zealand to Naples, Florida. His education and extensive experience eventually lead to an opportunity for him to help open The Chef's Academy in Morrisville. This has quickly grown to be a notable collising victoria in the Triangle area of North Curolina, offering education to those wishing to pursue a career in the collinary arts are notable collising.

In addition to his many cultivary awards and accomplishments, the theme consistent with Chef Eric is his passion for cultivary education and community involvement. Chef Eric India himself constantly inspired "with kannado style of cooking and mens ideas and travels the world realized them his formation and travels are himself or exposured and travels and himself or exposured and travels."









Did you know there's a place that grows fresh shrimp right here in Kansas? Shane is there to see what it takes:



Where's Shane? Sunflower Shrimp

This morning, Shane is in Oxford where they grow saltwater shrimp.











# **Mechanical Room**















